Amendments to the Claims

Listing of Claims:

Cancel claims 1 - 16.

Claim 17 (new). In a method for separating gas mixtures with a gas centrifuge, wherein a compressible process fluid is introduced into a double-walled rotor and the process fluid is compressed and separated due to centrifugal forces, wherein gas molecules with a relatively higher molecular weight contained in the gas mixture are enriched along an outer wall of the rotor, and portions of the process fluid with mutually different contents of the components contained in the gas mixture are carried away separately, the improvement which comprises:

introducing the process fluid from an axial central supply tube into a widening enveloping area of the compression area of a double-walled centrifuge rotor, with a gas mass flow being shaped and positively guided on a circular path as a axial distance increases through the flow channels in the compression area;

carrying the process fluid with a constant flow cross section in a centrifuged state in the double tube in flow channels in the area of the double-walled centrifuge rotor remote from the axis;

in the centrifuged state, separating the gas flow into a relatively heavy gas fraction and a relatively light gas fraction at a separating threshold dependent on a proportion by volume of the individual gases;

positively guiding, braking and carrying away the separate gas fractions separately with decreasing axial distance in the flow channels upstream of a transition from an area remote from the axis to the expansion area, as seen in a flow direction; and

wherein an acceleration of the gas molecules in the compression area and the braking of the gas fractions in the expansion area are proportional to the mass.

Claim 18 (new). The method according to claim 17, which comprises carrying the process fluid in flow channels formed between webs extending parallel to the axis, in the double-walled centrifuge rotor.

Claim 19 (new). The method according to claim 17, which comprises using axial fans in a central supply tube and/or in a central outlet tube, with a differential pressure increased in order to overcome flow losses of the process fluid throughout an entire centrifuge.

Claim 20 (new). The method according to claim 17, which comprises carrying the individual fractions of the gas mixture in flow channels separately from one another in the expansion area, and introduced the individual fractions separately into the central outlet tube.

Claim 21 (new). In a method for separating gas mixtures with a gas centrifuge, wherein a compressible process fluid is introduced into a double-walled rotor and the process fluid is compressed and separated due to centrifugal forces, wherein gas molecules with a relatively higher molecular weight contained in the gas mixture are enriched along an outer wall of the rotor, and portions of the process fluid with mutually different contents of the components contained in the gas mixture are carried away separately, the improvement which comprises:

introducing the process fluid from an axial central supply tube into a widening enveloping area of a compression area of a double-walled centrifuge rotor, with a flow cross section for the process fluid being proportional to a volume flow in the flow channels in the compression area;

carrying the process fluid, in the area of the double-walled centrifuge rotor remote from the axis, in the double tube in flow channels in proportion to the volume flow with a reducing flow cross section; and

separating the process fluid into a relatively heavy and into a relatively light gas fraction at a separating threshold, arranged concentrically as a function of a proportion by volume of individual gases, upstream of a transition from the area remote from the axis to an expansion area of the double-walled centrifuge rotor, as seen in a flow direction.

Claim 22 (new). The method according to claim 21, which comprises carrying the process fluid in flow channels formed between webs extending parallel to the axis, in the double-walled centrifuge rotor.

Claim 23 (new). The method according to claim 21, which comprises using axial fans in a central supply tube and/or in a central outlet tube, with a differential pressure increased in order to overcome flow losses of the process fluid throughout an entire centrifuge.

Claim 24 (new). The method according to claim 21, which comprises carrying the individual fractions of the gas mixture in flow channels separately from one another in the expansion area, and introduced the individual fractions separately into the central outlet tube.

Claim 25 (new). In a method for separating gas mixtures with a gas centrifuge, wherein a compressible process fluid is introduced into a double-walled rotor and the process fluid is compressed and separated due to centrifugal forces, wherein gas molecules with a relatively higher molecular weight contained in the gas mixture are enriched along an outer wall of the rotor, and portions of the process fluid with mutually different contents of the components contained in the gas mixture are carried away separately, the improvement which comprises:

introducing the process fluid from an axial central supply tube into a widening enveloping area of a compression area of the double-walled centrifuge rotor, with a flow cross section for the process fluid being inversely proportional to a pressure in flow channels in a compression area;

in an area of the double-walled centrifuge rotor remote from a rotor axis, carrying the process fluid in a double tube in flow channels with a flow cross section decreasing in inverse proportion to a pressure; and

separating the process fluid into a relatively heavy and into a relatively light gas fraction at a separating threshold located concentrically as a function of a proportion by volume of the individual gases, upstream of a transition from the area remote from the axis to the expansion area of the double-walled centrifuge rotor, as seen in a flow direction.

Claim 26 (new). The method according to claim 25, which comprises carrying the process fluid in flow channels formed between webs extending parallel to the axis, in the double-walled centrifuge rotor.

Claim 27 (new). The method according to claim 25, which comprises using axial fans in a central supply tube and/or in a central outlet tube, with a differential pressure increased in order to overcome flow losses of the process fluid throughout an entire centrifuge.

Claim 28 (new). The method according to claim 25, which comprises carrying the individual fractions of the gas mixture in flow channels separately from one another in the expansion area, and introduced the individual fractions separately into the central outlet tube.

Claim 29 (new). A gas centrifuge for separating gas mixtures, comprising:

a gas-carrying double-walled centrifuge rotor, formed as a rotating drum and forming a part of an electric-motor drive;

said the double-walled centrifuge rotor having a double wall structure wherein the process fluid is carried and a compression area formed with an annular flow cross section proportional to a mass flow until an area remote from the axis is reached;

the area of the double wall of said double-walled centrifuge rotor remote from the axis and carrying the process fluid having an annular flow cross section proportional to the mass flow as far as a start of an expansion area and remaining constant; and

a separating threshold which is concentric as a function of the proportion by volume of the individual gases is arranged upstream, in a flow direction, of the transition from the area of the double wall of the double-walled centrifuge rotor which is remote from the axis to the expansion area.

Claim 30 (new). The gas centrifuge according to claim 29 configured to carry out the method according to claim 17.

Claim 31 (new). The gas centrifuge according to claim 29 configured to carry out the method according to claim 21.

Claim 32 (new). The gas centrifuge according to claim 29 configured to carry out the method according to claim 25.

Claim 33 (new). The gas centrifuge according to claim 29, wherein said rotor is disposed to rotate about a vertical rotor axis.

Claim 34 (new). The gas centrifuge according to claim 29, which comprises webs, arranged continuously and parallel to said axis, formed within said walls of said double-walled centrifuge rotor, said webs ensuring that the process fluid flows with little turbulence.

Claim 35 (new). The gas centrifuge according to claim 29, which comprises a stationary housing connected in a gas-tight manner to central supply and outlet tubes carrying the process fluid.

Claim 36 (new). The gas centrifuge according to claim 29, which comprises central supply and outlet tubes carrying the process fluid and connected without contact to said centrifuge rotor by way of labyrinth seals.

Claim 37 (new). The gas centrifuge according to claim 29, wherein said expansion area is formed with flow channels separated from one another for transportation of the gas fractions obtained at the separating threshold and having mutually different densities.

Claim 38 (new). The gas centrifuge according to claim 29, which comprises an annular channel, for holding the relatively heavy gas fraction, disposed in said central outlet tube.

Claim 39 (new). The gas centrifuge according to claim 29, which comprises an extraction nozzle, for extraction of the relatively heavy gas fraction, disposed on a central outlet tube at the outlet for the relatively light gas fraction.

Claim 40 (new). A gas centrifuge for separating gas mixtures, comprising:

a gas-carrying double-walled centrifuge rotor, formed as a rotating drum and forming a part of an electric-motor drive;

said the double-walled centrifuge rotor having a double wall structure wherein the process fluid is carried and a compression area formed with an annular flow cross section tapering proportionally to a volume flow until an area remote from the axis is reached;

the area of the double wall of said double-walled centrifuge rotor remote from the axis and carrying the process fluid having an annular flow cross section proportional to the volume flow as far as the start of the expansion area; and

a separating threshold which is concentric as a function of the proportion by volume of the individual gases is arranged upstream, in a flow direction, of a

transition from the area of the double wall of the double-walled centrifuge rotor which is remote from the axis to the expansion area.

Claim 41 (new). The gas centrifuge according to claim 40 configured to carry out the method according to claim 17.

Claim 42 (new). The gas centrifuge according to claim 40 configured to carry out the method according to claim 21.

Claim 43 (new). The gas centrifuge according to claim 40 configured to carry out the method according to claim 25.

Claim 44 (new). The gas centrifuge according to claim 40, wherein said rotor is disposed to rotate about a vertical rotor axis.

Claim 45 (new). The gas centrifuge according to claim 40, which comprises webs, arranged continuously and parallel to said axis, formed within said walls of said double-walled centrifuge rotor, said webs ensuring that the process fluid flows with little turbulence.

Claim 46 (new). The gas centrifuge according to claim 40, which comprises a stationary housing connected in a gas-tight manner to central supply and outlet tubes carrying the process fluid.

Claim 47 (new). The gas centrifuge according to claim 40, which comprises central supply and outlet tubes carrying the process fluid and connected without contact to said centrifuge rotor by way of labyrinth seals.

Claim 48 (new). The gas centrifuge according to claim 40, wherein said expansion area is formed with flow channels separated from one another for transportation of the gas fractions obtained at the separating threshold and having mutually different densities.

Claim 49 (new). The gas centrifuge according to claim 40, which comprises an annular channel, for holding the relatively heavy gas fraction, disposed in said central outlet tube.

Claim 50 (new). The gas centrifuge according to claim 40, which comprises an extraction nozzle, for extraction of the relatively heavy gas fraction, disposed on a central outlet tube at the outlet for the relatively light gas fraction.

Claim 51 (new). A gas centrifuge for separating gas mixtures, comprising:

a gas-carrying double-walled centrifuge rotor, formed as a rotating drum and forming a part of an electric-motor drive;

said the double-walled centrifuge rotor having a double wall structure wherein the process fluid is carried and a compression area formed with an annular flow cross section tapering inversely proportionally to a pressure until an area remote from the axis is reached;

the area of the double wall of said double-walled centrifuge rotor remote from the axis and carrying the process fluid having an annular flow cross section inversely proportional to the pressure as far as the start of the expansion area; and

a concentric separating threshold arranged upstream, in a flow direction, of a transition from the area of the double wall of the double-walled centrifuge rotor which is remote from the axis to the expansion area.

Claim 52 (new). The gas centrifuge according to claim 51 configured to carry out the method according to claim 17.

Claim 53 (new). The gas centrifuge according to claim 51 configured to carry out the method according to claim 21.

Claim 54 (new). The gas centrifuge according to claim 51 configured to carry out the method according to claim 25.

Claim 55 (new). The gas centrifuge according to claim 51, wherein said rotor is disposed to rotate about a vertical rotor axis.

Claim 56 (new). The gas centrifuge according to claim 51, which comprises webs, arranged continuously and parallel to said axis, formed within said walls of said double-walled centrifuge rotor, said webs ensuring that the process fluid flows with little turbulence.

Claim 57 (new). The gas centrifuge according to claim 51, which comprises a stationary housing connected in a gas-tight manner to central supply and outlet tubes carrying the process fluid.

Claim 58 (new). The gas centrifuge according to claim 51, which comprises central supply and outlet tubes carrying the process fluid and connected without contact to said centrifuge rotor by way of labyrinth seals.

Claim 59 (new). The gas centrifuge according to claim 51, wherein said expansion area is formed with flow channels separated from one another for transportation of the gas fractions obtained at the separating threshold and having mutually different densities.

Claim 60 (new). The gas centrifuge according to claim 51, which comprises an annular channel, for holding the relatively heavy gas fraction, disposed in said central outlet tube.

Claim 61 (new). The gas centrifuge according to claim 51, which comprises an extraction nozzle, for extraction of the relatively heavy gas fraction, disposed on a central outlet tube at the outlet for the relatively light gas fraction.